REMARKS

By this Amendment, claims 1 and 3-6 have been amended, and new claims 7 and 8 have been added. The amendments do not narrow the scope of at least claims 3-5. Support for the features recited in claims 7 and 8 is provided in Claim 1. Claims 1-8 are pending in the application. The specification has been amended at paragraph [0001] to update the status of U.S. Patent Application No. 09/973,868. As suggested in the Office Action, the title has been amended to more closely correspond to the claimed subject matter. Reconsideration of the Official Action is respectfully requested in view of the following remarks.

Personal Interview

Applicants thank Examiner Kim for the courtesies extended to their undersigned representative during the personal interview on October 14, 2004. The substance of the interview is incorporated in the following remarks.

Objection to Specification

The Office Action asserts that "essential material" is incorporated in the specification by reference to a foreign application or patent at paragraph [0051]. Paragraph [0051] of the specification incorporates EP 0 780 629 into the present application by reference in its entirety. As suggested in the interview, the specification has been amended at paragraph [0051] to incorporate by reference U.S. Patent No. 5,735,687, which is a member of the patent family that includes EP 0 780 629. In addition, a Declaration by the undersigned is submitted herewith, which states that the material incorporated by reference to U.S. Patent No.

5,735,687 is the same material incorporated by reference to EP 0 780 629. A copy of U.S. Patent No. 5,735,687 is attached hereto for the Examiner's convenience. Accordingly, withdrawal of the objection is respectfully requested.

Rejection Under 35 U.S.C. §102

Claim 1 stands rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 5,664,943 to Joos et al. ("Joos"). The rejection is respectfully traversed.

Claim 1, as amended, is directed to a process for the operation of a burner, which comprises "providing a burner for a heat generator, the burner including a swirl generator for receiving and swirling at least part of a combustion air flow, the swirl generator defining a central burner axis and having an internal space, the swirl generator configured and arranged for tangentially introducing the combustion air flow into the internal space, the internal space defining a cross sectional throughflow area"; "providing means for the introduction of at least one fuel into the combustion air flow, means at a downstream end of the swirl generator for forming an abrupt widening of the cross sectional throughflow area, and an injection device configured and arranged for the introduction of an axial central air flow along the central burner axis, the injection device including an adjustable element configured and arranged for altering a throughflow cross section of the injection device and for the control of the mass flow of the axial central air flow"; and "controlling the axial central air mass flow, thereby controlling an axial position of a recirculation zone, in (i) strongly throttling the axial central air mass flow at low burner load, and (ii) weakly throttling or no throttling of the axial central air mass flow at high burner load" (emphasis added).

According to the claimed process, a swirl generator is configured and arranged for tangentially introducing combustion air flow into the internal space of the swirl generator, and an injection device is configured and arranged for the introduction of an axial central air flow along the central burner axis. In the claimed process, the combustion air flow is different from the axial central air flow. An adjustable element of the injection device is configured and arranged for altering a throughflow cross section of the injection device and for controlling the mass flow of the axial central air flow.

The claimed process comprises "controlling the axial central air mass flow, thereby controlling an axial position of a recirculation zone, in (i) strongly throttling the axial central air mass flow at low burner load, and (ii) weakly throttling or no throttling of the axial central air mass flow at high burner load." Support for the amendments to claim 1 is provided, for example, at paragraph [0012] of the specification. The specification explains that, at a low burner load, the amount of air introduced centrally (i.e., the axial central air mass flow) can be reduced (by strongly throttling the axial central air mass flow) such that the recirculation zone forms near to the burner mouth or even partially within the burner interior. In contrast, at a high burner load, the amount of air introduced centrally can be increased (by no throttling or weak throttling of the axial central air mass flow) such that the recirculation zone is situated downstream of the burner mouth. Consequently, thermal overloading of the burner can be prevented by the claimed process. The claimed process thus provides for controlling of the axial central air mass flow, and thereby the axial position of the recirculation zone, by adjusting the adjustable element of the injection device.

Joos fails to disclose each and every feature of the process recited in claim 1. Joos discloses a method for operating a combined burner. The Office Action asserts that Joos discloses a burner 1 for a "heat generator" 10 (i.e., burner chamber 10); a swirl generator for tangentially introducing combustion air flow into an internal space of the swirl generator; an "injection device (35, 37, Fig. 14) or (35, 40, Fig. 15) or 41, 42 (Fig. 16)" including "an adjustable element" to control the mass flow of axial central air flow; and further that "throttling of the air flow as a function of load is explicitly taught." The Office Action further asserts that:

> As for strongly throttling the axial central air flow at low burner load; and weakly throttling or no throttling of the central air flow at high burner load, this is the inherent operative condition, i.e. for low load, there is low fuel flow and thus low airflow required which corresponds to the strongly throttled condition; at high load, more air and fuel is required and thus less throttling.

The Office Action further asserts that evidence of this asserted inherency of the throttling of the airflow at these conditions by Joos is evidenced by U.S. Patent No. 5,292,244 to Xiong ("Xiong") or U.S. Patent No. 5,533,329 to Ohyama et al. ("Ohyama").

Applicants respectfully disagree with these assertions. First, The Office Action has failed to establish the asserted inherent disclosure of the claimed subject matter by Joos. As explained at MPEP § 2112(IV), page 2100-54 (Rev. 2, May 2004), "[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic" (citation omitted). As stated by the Federal Circuit in Crown Operations International, Ltd. v. Solutia, 62 USPQ2d 1917, 1921 (Fed. Cir. 1999), "[a]n anticipating reference must describe the patented subject matter with sufficient clarity and detail to establish that the subject matter existed in the prior art and that

such existence would be recognized by persons of ordinary skill in the field of the invention." Also, "[I]nherency 'may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient'" Id. at 62 USPQ2d 1923 (emphasis added, citations omitted).

Applicants respectfully submit that the Official Action does not provide evidence that establishes Joos' burner must operate in a manner such that an axial central air flow is strongly throttled at low burner load and weakly throttled or not throttled at high burner load. That is, the Office Action fails to establish that Joos' method for operating the burner must include this operative condition.

Joos does not disclose changing the location of a recirculation zone by changing an axial central air mass flow. In contrast, Joos discloses weakening an axial impulse of blast air by a mechanism of swirl adjustment, rather than by controlling the mass flow of the blast air. See column 2, lines 18-35, of Joos.

Applicants further note that Joos discloses using liquid fuel pressure to actuate an adjusting mechanism and to open an air flow when the burner is operated on liquid fuel. See column 5, lines 57-62. However, Joos does not disclose regulating the blast air flow as a function of the fuel flow, but, in contrast, teaches to use the fuel pressure to actuate the adjusting mechanism 35 and thus open the air-inlet openings 19.

Joos thus does not expressly or inherently disclose each and every feature of claim 1, including the features of "controlling the axial central air mass flow, thereby controlling an axial position of a recirculation zone, in (i) strongly throttling the axial central air mass flow at low burner load, and (ii) weakly throttling or no throttling of the axial central air mass flow at high burner load." Moreover, Joos does not

expressly or inherently disclose controlling the axial position of a recirculation zone at high load and low load by adjusting an adjustable element of an injection device that introduces such axial central air flow along a central burner axis.

Applicants submit that neither Xiong nor Ohyama provides evidence that Joos' disclosed method must include each and every feature of the process recited in claim 1. Particularly, Xiong discloses a premixed fuel/air burner. Xiong discloses utilizing combustion air flow. See, for example, FIG. 2 including combustion air inlet 12. Xiong discloses variations in the air/fuel ratio to affect combustion air flow. Xiong does not disclose utilizing a combustion air flow and an axial central air flow, as recited in claim 1, much less the features of "controlling the axial central air mass flow, thereby controlling an axial position of a recirculation zone, in (i) strongly throttling the axial central air mass flow at low burner load, and (ii) weakly throttling or no throttling of the axial central air mass flow at high burner load." Thus, Xiong fails to provide evidence to support the asserted inherency of operation of Joos' process.

Ohyama discloses a control method of a gas turbine. Ohyama also discloses a combustion air flow, but not an axial central air flow, as recited in claim 1. The Office Action references FIG. 3 of Ohyama. However, FIG. 3 depicts the relationship between the amount of all air supplied to the combustor and the fuel amount. This curve is not directed, for example, to a relationship between an axial central air flow and the fuel amount. Accordingly, Ohyama also does not disclose utilizing a combustion air flow and an axial central air flow, as recited in claim 1, much less the features of "controlling the axial central air mass flow, thereby controlling an axial position of a recirculation zone, in (i) strongly throttling the axial central air mass flow

at low burner load, and (ii) weakly throttling or no throttling of the axial central air mass flow at high burner load." Thus, Ohyama also fails to provide evidence to support the asserted inherency of operation of Joos' process.

Thus, Applicants submit that Joos does not expressly or inherently anticipate the process of claim 1. Therefore, withdrawal of the rejection is respectfully requested.

First Rejection Under 35 U.S.C. § 103

Claim 1 stands rejected under 35 U.S.C. § 103(a) over Joos in view of Xiong or Ohyama. The rejection is respectfully traversed.

For the reasons stated above, the combination of Joos and Xiong, or of Joos and Ohyama, fails to anticipate the process of claim 1. Applicants submit that the cited references also fail to suggest modifying Joos' process to result in the process for the operation of a burner, as recited in claim 1, which tangentially introduces a combustion air flow into an internal space of the burner, introduces an axial central air flow with an injection device, and with the injection device controls the axial central air mass flow, "thereby controlling an axial position of a recirculation zone, in (i) strongly throttling the axial central air mass flow at low burner load, and (ii) weakly throttling or no throttling of the axial central air mass flow at high burner load." Thus, the cited references also fail to render obvious the process, as recited in claim 1.

Therefore, withdrawal of the rejection is respectfully requested.

Second Rejection Under 35 U.S.C. § 103

Claims 1-5 stand rejected under 35 U.S.C. 103(a) over Joos in view of Ohyama and Xiong. The rejection is respectfully traversed.

For the reasons stated above, neither Xiong nor Ohyama cures the deficiencies of Joos with respect to the process of claim 1. Particularly, the combination of Joos, Xiong and Ohyama fails to suggest modifying Joos' process to result in the process for the operation of a burner, as recited in claim 1, which tangentially introduces a combustion air flow into an internal space of the burner, introduces an axial central air flow with an injection device, and with the injection device controls the axial central air mass flow, "thereby controlling an axial position of a recirculation zone, in (i) strongly throttling the axial central air mass flow at low burner load, and (ii) weakly throttling or no throttling of the axial central air mass flow at high burner load." Thus, the cited references fail to render obvious the process, as recited in claim 1.

It is asserted at page 6 of the Office Action that Ohyama discloses determining a fuel mass flow and controlling an air mass flow dependent on that fuel mass flow. Applicants respectfully disagree. In contrast, Ohyama discloses promptly changing the air flow in response to any change in the air amount, so that a fuel air ratio can be kept constant. In the claimed process, undesired effects are counteracted in varying the axial central air mass flow rather than the combustion air flow or the fuel flow rate.

Claims 2-5 also are not rendered obvious by the cited combination of references for at least the same reasons as those stated above regarding claim 1.

Moreover, these claims recite additional combinations of features that further patentably distinguish the claimed process over the cited references. For example, claim 4 recites the features that "a material temperature of the burner is measured, and wherein the axial central air mass flow is controlled in dependence on the measured material temperature." The Office Action asserts that Ohyama discloses "measuring a material temperature of the burner." However, Ohyama discloses sensing temperature of gas at the premixing section using sensors 50, 51 (column 6, lines 25-31). As shown in FIG. 1 of Ohyama, the sensor 50 is located in a passage of the premixing section 7, and the sensor 51 is located at an air flow valve 10. The gas is not a "material" of a burner, but rather is a unrelated substance that is introduced into the device. In contrast, in an embodiment of the claimed process, the material temperature of the burner itself is measured. See FIG. 16 and paragraph [0063]. Ohyama provides no motivation to modify the process of Joos to result in the process recited in claim 4.

Claim 5 recites "the process according to Claim 1 in a combustion chamber of a gas turbine plant, wherein combustion pulsations are measured, and wherein the axial central air mass flow is controlled in dependence on the measured combustion pulsations" (emphasis added). It is asserted in the Official Action that Ohyama discloses measuring combustion pulsations pressure and controlling the airflow thereby. However, as explained above, Ohyama does not control an axial central air flow, which is different from a combustion air flow. Accordingly, Ohyama also provides no motivation to modify the process of Joos to result in the process recited in claim 5.

Therefore, withdrawal of the rejection is respectfully requested.

Third Rejection Under 35 U.S.C. § 103

Claim 3 stands rejected under 35 U.S.C. § 103(a) over Joos in view of either Xiong or Ohyama, and further in view of U.S. Patent No. 5,661,967 to Farkas et al. ("Farkas"). The rejection is respectfully traversed.

The Office Action acknowledges that Joos fails to disclose determining the load based on a setting of the front guide vane set of a compressor of a gas turbine plant, as recited in claim 3. However, the Office Action asserts that Farkas cures the deficiencies of Joos. Applicants respectfully disagree.

Farkas discloses a method of sequentially operating a gas turbine group. Farkas does not, however, provide any suggestion or motivation to modify Joos' process to include the features of "controlling the axial central air mass flow, thereby controlling an axial position of a recirculation zone, in (i) strongly throttling the axial central air mass flow at low burner load, and (ii) weakly throttling or no throttling of the axial central air mass flow at high burner load," as recited in claim 1. Accordingly, claim 3 would not have been rendered obvious by the cited combination of references for at least the same reasons as those stated above for claim 1.

Therefore, withdrawal of the rejection is respectfully requested.

Fourth Rejection Under 35 U.S.C. § 103

Claim 3 stands rejected under 35 U.S.C. § 103(a) over Joos in view of Xiong or Ohyama, and further in view of U.S. Patent No. 6,216,437 to Hepner et al. ("Hepner"). The rejection is respectfully traversed.

The Office Action acknowledges that Joos fails to disclose determining the load based on generator power, as recited in claim 3. However, the Office Action asserts that Hepner cures the deficiencies of Joos. Applicants respectfully disagree.

Hepner discloses a method of sequentially operating a gas turbine group. Hepner does not, however, provide any suggestion or motivation to modify Joos' process to include the features of "controlling the axial central air mass flow, thereby controlling an axial position of a recirculation zone, in (i) strongly throttling the axial central air mass flow at low burner load, and (ii) weakly throttling or no throttling of the axial central air mass flow at high burner load," as recited in claim 1. Accordingly, claim 3 would not have been rendered obvious by the cited combination of references for at least the same reasons as those stated above for claim 1.

Therefore, withdrawal of the rejection is respectfully requested.

New Claims

Applicants submit that new dependent claims 7 and 8 are also patentable for the reasons stated above with respect to claim 1.

Conclusion

For the foregoing reasons, allowance of the application is respectfully requested. Should there be any questions concerning this response, it would be appreciated if the Examiner would contact Applicants' undersigned representative at the number given below.

Respectfully submitted,

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